

509-R-754 PORTLAND CEMENT CONCRETE PAVEMENT, PCCP, JOINT REPAIR

(Adopted 10-20-22)

The Standard Specifications are revised as follows:

SECTION 509, BEGIN LINE 36, DELETE AND INSERT AS FOLLOWS:

509.03 Concrete Mix Design

A concrete mix design, CMD, for the partial depth joint repair and bottom-half joint repair shall be identified as being one of the following types and shall be in accordance with 509.04.

- (a) Prepackaged concrete patching material, CPM
- (b) Ordinary portland cement-based concrete, OPCC
- (c) Rapid hardening cement-based concrete, RHCC
- ~~(d) Latex modified concrete, LMC~~
- ~~(e)~~ Latex modified concrete, very early strength, LMC-VE
- ~~(f)~~ Rapid setting patch materials, RSP.

A concrete mix design submittal, CMDS, for OPCC, RHCC, ~~LMC~~, and LMC-VE shall be submitted in accordance with 506.03, except that the trial batch shall be in accordance with 509.05. Prepackaged concrete patching materials, CPM and RSP, are not required to follow the submittal format of a CMDS, however, the Department shall be notified of their intended use. The CMDS, or notification of using CPM or RSP, shall be submitted a minimum of seven calendar days prior to the trial batch.

509.04 Concrete Mix Criteria

The fine aggregate for OPCC, RHCC, ~~LMC~~, or LMC-VE shall be at least 48% but not more than 52% of the total volume of the aggregate in each unit volume of concrete. Proportions shall be based on aggregates in the bulk SSD condition.

The blend of coarse and fine aggregates for OPCC, RHCC, ~~LMC~~, or LMC-VE shall meet the requirements stated in the table below. Aggregate volumes within the repair concrete will be determined based on the bulk SSD properties for each aggregate:

SECTION 509, BEGIN LINE 100, DELETE AS FOLLOWS:

(b) RHCC, ~~LMC~~, or LMC-VE

RHCC, ~~LMC~~, or LMC-VE shall be proportioned to meet the following requirements and properties:

Portland cement content for LMC	658 lb/cu yd, minimum
Rapid hardening cement content	
for RHCC or LMC-VE	658 lb/cu yd, minimum
Latex modifier for LMC or LMC-VE	3.5 gal/94 lb cement
Maximum allowable water/cementitious ratio	
for LMC	0.400 ^A
Maximum allowable water/cementitious ratio	
for LMC-VE	0.440 ^A
Maximum allowable water/cementitious ratio	
for RHCC	0.450 ^B

Slump.....3 to 7 in.^C
 Air Content for RHCC6.5% ±1.5%^D
 Air Content for ~~LMC and LMC-VE~~0.0% - 6.0%

SECTION 509, BEGIN LINE 129, DELETE AS FOLLOWS:

^D If the RHCC has a permeability of 900 coulombs or less at 56 days, the acceptable range of air content is allowed to be the same as ~~LMC and LMC-VE~~. Verification of this property will be determined from testing of specimens cast at the trial batch. Testing will be done per AASHTO T 277, with the value determined by averaging the result of two specimens.

^E Concrete beams and cylinders cast for the purpose of evaluating the mix criteria shall be cured in accordance with AASHTO T 23 Section 10.1, Standard Cure conditions. RHCC and LMC-VE shall achieve the minimum modulus of rupture in 12 hours or less. ~~LMC shall achieve the minimum modulus of rupture in 24 hours or less.~~ RHCC, ~~LMC~~, and LMC-VE shall provide opening to traffic within the requirements for maintenance of traffic and lane closure restrictions.

SECTION 509, BEGIN LINE 222, DELETE AS FOLLOWS:

509.06 Trial Batch

A trial batch shall be produced and tested to verify that the repair concrete is in accordance with the appropriate concrete mix criteria for CPM, OPCC, RHCC, ~~LMC~~, LMC-VE, or RSP material. The trial batch shall be conducted prior to production. The equipment used for mixing concrete at the trial batch shall be the same as what is identified in the QCP for use during field production.

SECTION 509, BEGIN LINE 237, DELETE AS FOLLOWS:

	CPM	OPCC	LMC	RHCC, LMC-VE	RSP
Compressive strength	12, 36, 72 h	12, 36, 72 h	12, 24, 48 h	3, 6, 12, 24 h	3, 6, 12 h
Modulus of rupture	12, 36, 72 h	12, 36, 72 h	12, 24, 48 h	3, 6, 12, 24 h	3, 6, 12 h
Plastic testing	air, slump, W/C ratio*	relative yield, air, slump, W/C ratio*	relative yield, air, slump	relative yield, air, slump	slump
*The W/C ratio will be calculated after mix has been tested for slump.					

SECTION 509, BEGIN LINE 438, DELETE AS FOLLOWS:

~~LMC and LMC-VE~~ shall be mixed in a mobile type volumetric mixer meeting the requirements of 722.09(a). The Engineer may also allow batching and mixing of OPCC or RHCC in a mobile-type volumetric mixer except the mixer shall carry sufficient quantities of unmixed ingredients to produce at least 2 cu yds and is not required to be self-propelled. Calibration of the mixer shall be in accordance with 722.13.

SECTION 509, BEGIN LINE 458, DELETE AS FOLLOWS:

509.12 Placing and Finishing Concrete

CPM, OPCC, and RSP repair concrete shall be placed within 15 minutes of mixing. RHCC, ~~LMC~~, and LMC-VE shall be placed within five minutes of mixing. All repair concrete shall be placed such that a cold joint does not occur within the limits of an individual, or intersecting, longitudinal or transverse joint repair. Placement may be

isolated to one side of a joint if the joint face or joint filler is properly supported. Repair along a transverse joint that intersects a previously repaired longitudinal joint is allowed as described in 509.08.

SECTION 509, BEGIN LINE 477, DELETE AS FOLLOWS:

For RHCC, ~~LMC~~, and LMC-VE, thoroughly soak the cleaned surface and maintain it in a wet condition for at least 2 h immediately prior to placing the repair concrete. Maintaining a wet surface shall be accomplished by covering the soaked surface with wet burlap. The burlap shall be re-wetted as necessary. A layer of white opaque polyethylene film, that is at least 4 mils thick, may be used to offset the need to rewet the burlap. Prior to placing the joint repair material, the burlap shall be removed. Any standing water in depressions, holes, or areas of concrete removal shall be blown out with compressed air or other type of blower sufficient for removal, or by ~~the use of~~ *using* an approved vacuum system. The surface shall be damp at time of placing the repair concrete. Bonding grout shall not be used.

SECTION 509, BEGIN LINE 517, DELETE AS FOLLOWS:

Immediately upon completion of finishing and texturing of the partial depth joint repair for all material types including CPM, OPCC, RHCC, ~~LMC~~, LMC-VE, and RSP, grout shall be applied with a brush to the entire perimeter of the repair. Proportioning and mixing of the grout shall be the same as previously described in this section for bonding of CPM and OPCC material.
